No.	Page	Section	Type
C0	All	All	R

G-15

C1	4	1.0	C
C2	5	2.0	C
C3	6	3.1.1	C

Comment and Requested Modification

Please refer to general comment #G-15, which describes Powertech's assertion that the Draft Cumulative Effects Analysis extends well beyond EPA's regulatory requirement under 40 CFR § 144.33(c)(3), since many aspects do not relate to drilling and operation of the Class III or V injection wells. To clarify, while Powertech believe such a cumulative impact analysis should not be a part of these draft permit documents, comments are included in event EPA decides to further pursue this analysis and, in such an event, the following comments should be considered. NRC has already completed a NEPA assessment for the project, documented in the supplemental environmental impact statement (Exhibit 008), which EPA has already reviewed and provided comments. EPA's cumulative effects analysis represents duplication of these previous efforts.

The Draft Cumulative Effects Analysis extends well beyond EPA's regulatory requirement under 40 CFR § 144.33(c)(3). That requirement allows authorization for multiple injection wells under an area permit provided that "[t]he cumulative effects of drilling and operation of additional injection wells are considered by the Director during evaluation of the area permit application and are acceptable to the Director" (emphasis added). Many aspects of the Draft Cumulative Effects Analysis do not relate to drilling and operation of the Class III or V injection wells, including: potential groundwater consumption and drawdown, which are only related to production wells and Madison water supply wells (Sections 3.1 and 3.2), potential effects of storage ponds on groundwater quality (Section 3.3.4), potential impacts from spills and leaks other than those from injection wells (Sections 3.3.5, 5.0 and 5.7), diversion channels around ponds and facilities (Section 4.2.3), potential impacts from land application for treated wastewater (Sections 4.7.2 and 7.3), potential pipeline leaks (Section 5.1), potential header house leaks (Section 5.2.1), potential processing facility leaks (Section 5.3), potential transportation accidents (Section 5.5), potential pond leaks (Section 5.6), potential land use impacts other than those related to injection wells (Section 6.0), potential radiological impacts (Section 9.0), potential air quality impacts other than those related to construction and operation of Class III and V injection wells (Section 10.0), potential climate change impacts other than those related to construction and operation of Class III and V injection wells (Section 11.0), potential transportation impacts (Section 12.0), potential impacts from accidents (Section 13.0) and potential impacts from waste management (Section 15.0). Such a cumulative effects analysis is not provided for under UIC regulations and should not be included in the draft permit documents

The statement is made that "Powertech's current design for the treatment and storage of ISR waste fluids do not appear to meet the requirements under Clean Air Act regulations found out **40 CFR part 61, subpart W**." Please refer to comment #C42, which asks EPA to update the discussion on compliance with subpart W considering the final rule that was issued in January 2017 and Powertech's November 2014 commitments to modify impoundment designs to comply with the final rule. Powertech requests that EPA update this discussion based on changes in the final rule and Powertech's commitment to comply with the final rule.

With regard to EPA's review of the final NRC SEIS, the statement is made that "the EPA review letter for the Final SEIS included discussion of some remaining concerns and suggestions for how to address them" (emphasis added). Powertech requests clarifying that there were only two concerns expressed in EPA's comment letter on the final SEIS and that both issues are addressed in the Draft Class III Area Permit (pond permitting requirements under subpart W and monitoring domestic well #18).

The statement is made that "During groundwater restoration, contaminated water is pumped from the wellfield injection interval, treated with reverse osmosis, and most of the clean permeate from the reverse osmosis treatment process is reinjected." Powertech requests clarifying that reverse osmosis would only be used in the deep disposal well option.

Comment type key:

A – alternate approach proposed;
C – correct to be consistent with application, regulations or NRC license requirements;
E – additional explanation requested;
I – inconsistency (internally inconsistent between parts of Draft permit or supporting documents);
R – remove; inconsistent with application, regulations or NRC license requirements;
T – typographical error

C4	8	3.1.1	I
C5	9	3.1.1	I
C6	10	3.1.2	T
C7	11	3.1.2	T
C8	12	3.2.1	C
C9	12 15	3.2.1 3.2.1.2	I
C10	17	3.2.2	I

The statement is made that "during operations, Powertech will take over control of all Inyan Kara wells located inside the project boundary." This is inconsistent with Section 3.2.1.1 of this document, which correctly states that Powertech will remove all drinking water wells within the project boundary from drinking water use and remove all stock wells within ¼ mile of wellfields from private use. Powertech requests correcting the inconsistency.

The statement is made that "if any [private Inyan Kara wells] are located close to an ISR wellfield and cause a breach in a confining zone ... Powertech will provide an alternative water source to well owners by installing a Madison water supply well, as discussed in Section 3.2.1.1." The referenced section discusses two options for replacing a private well: installing a replacement well or alternate water supply such as a pipeline from a Madison well. A replacement well would not necessarily be installed in the Madison aquifer. For example, it could be installed in the Sundance/Unkpapa aquifer. Powertech requests updating this discussion for consistency with commitments in the Class III permit application.

In the last paragraph on this page, Powertech requests correcting typographical errors as follows: "Table 6 is Table 2-1 in Powertech's Report to Accompany Madison Water Right Permit Application shows a different breakout of the maximum estimated Madison usage as shown in Table 54. The maximum anticipated Madison usage is one gallon per minute more in Table ~~65~~ than in Table 54."

In the last sentence on this page, Powertech requests correcting a typographical error as follows: "Therefore, the EPA finds that the impacts from Powertech's proposed net withdrawal of Madison ~~Inyan Kara~~ groundwater will not affect the availability of groundwater for other Madison groundwater users."

The statement is made that "The EPA reviewed the information Powertech provided about the potentiometric surface drawdowns of the Inyan Kara Aquifers expected from the maximum gross pumping rate of 8,500 gpm." Since it is the net pumping rate and not the gross pumping rate that affects drawdown, Powertech requests correcting this as follows: "The EPA reviewed the information Powertech provided about the potentiometric surface drawdowns of the Inyan Kara Aquifers expected from the maximum net ~~gross~~ pumping rate of 170 ~~8,500~~ gpm Powertech is requesting from the DENR Water Rights Program."

The statement is made that "the potentiometric surface elevations are expected to recover to within one to two feet at the locations of the pumping well after decommissioning of the project" (emphasis added). This is inconsistent with the permit application and Section 3.2.1.2 of this document, which correctly states that the elevations are expected to recover within one to two feet after ISR operations end, as opposed to after decommissioning, which may take years after ISR operations end depending on the length of stability monitoring, regulatory approval of successful groundwater restoration, and post-restoration groundwater monitoring, if required. This comment also applies to the similar statement on the bottom of page 15. Powertech requests changing "after decommissioning of the project" to "after ISR operations" in both instances.

The statement is made that estimated drawdown of the Madison aquifer at 551 gpm pumping is "86.8 feet at the Dewey-Burdock site." Powertech requests clarifying that this is the estimated drawdown at the pumping well, not across the project site. This is correctly stated on page 18, which indicates that the DENR "calculated the drawdown in the Madison aquifer potentiometric surface from the Madison water supply wells to be 86.8 feet at the well locations within the Dewey-Burdock Project Area."

C11	19	3.3.1	C
C12	26	3.3.4	T
C13	29	Fig. 9b	T
C14	32	Fig. 12a	T
C15	32	Fig. 12b	T
C16	33	Fig. 13a	T
C17	33	Fig. 13b	T
C18	34	3.3.4.2	E
C19	26	3.3.4.2	C
C20	37	3.5	C
C21	38	3.5	T
C22	38	4.0	I
C23	43	4.2.3	T
C24	43	4.2.3	T

The statement is made that "The NRC license requires Powertech to conduct groundwater restoration to the wellfield injection zone to restore the groundwater to pre-ISR conditions" (emphasis added). While it would be appropriate to characterize the NRC restoration requirements as consistent with pre-ISR conditions, the requirements in 10 CFR Part 40, Appendix A, Criterion 5B(5) are to restore the water to baseline or an MCL, whichever is higher, or an ACL through the rigorous ACL approval process. Powertech requests correcting this statement as follows:
The NRC license requires Powertech to conduct groundwater restoration to the wellfield injection zone to restore the groundwater to meet 10 CFR Part 40, Appendix A, Criterion 5B(5) requirements ~~pre-ISR conditions~~.
Powertech requests correcting "Burdock pond designs" to "Dewey-Burdock pond designs".
Powertech requests correcting "HDPA liner" to "HDPE liner".
Powertech requests correcting "HDPA liner" to "HDPE liner".
Powertech requests correcting "HDPA liner" to "HDPE liner".
Powertech requests correcting "HDPA liner" to "HDPE liner".
Powertech requests correcting "HDPA liner" to "HDPE liner".

No justification appears to be provided for the statement that a leak from a pond storing treated water will result in "extensive impact ... which will be difficult and expensive to remediate" by the time the leak is detected in the pond detection monitoring system required by the NRC. The pond detection monitoring system required by License Condition 12.25 in SUA-1600 will be designed as an early warning system using non-hazardous indicator parameters, similar to what is done for excursion monitoring in the wellfields. Based on this requirement, the fact that the ponds with single HDPE liners overlying clay liners will only store treated water, and the fact that the ponds will be about 1 mile away from Pass Creek, there is a low likelihood of an "extensive impact" from a pond leak. Powertech requests revising this discussion to address these considerations.
See comments #C1 and #C42. The statement that "subpart W ... requires that there be no more than two ponds, each with a surface area of no more than 40 acres that are in operation at any given time" is not supported by the final subpart W rule. Powertech requests updating this discussion.
Powertech requests adding to the list of mitigation measures to prevent groundwater impacts the groundwater detection monitoring plan required by NRC License Condition 12.25 (**Exhibit 016 at 14-15**).
Powertech requests removing "as" in "designated monitoring wells ~~as~~ during operations" in the number 8 listed at the top of this page.
In the second paragraph in Section 4.0 and various locations throughout the document, Powertech's Large Scale Mine Permit application is incorrectly referenced as "the South Dakota DENR Large Scale Mine Permit." Since the permit has not yet been issued pending completion of the state hearing, Powertech requests changing all references to the Large Scale Mine Permit Application, which is done correctly at some locations within the document (e.g., at the bottom of page 36).
In the 2nd sentence in this section, Powertech requests correcting "Table 8" to "Table 7".

In the 2nd to last paragraph on this page, 5th line, Powertech requests correcting a typographical error as follows: "and 5.3-7 provide the locations of planned ephemeral stream channels ~~diversions~~ within the permit area."

40 CFR part 62, Subpart W

C25	48	4.5	C
	70	6.0	
C26	51	4.6	T
C27	52	4.7.1	I
C28	52	4.7.1	
C29	55	4.8	T
C30	55	5.0	C
C31	68	6.0	T
C32	70	6.0	T
C33	71	6.0	T
C34	71	7.0	T

The statement is made that "Powertech will use a phased approach to wellfield development beginning with wellfield 1 in the Dewey and Burdock Areas." See comment #F8 in Table 2, which describes how this statement is inconsistent with Section 10.10 (p. 10-13) of the Class III permit application, which states that Powertech may develop either the Burdock or Dewey area wellfields first, followed by those in the other area. Powertech's current plans include developing Burdock area wellfields prior to those in the Dewey area (**Exhibit 026**). This comment also applies to a similar statement on page 70. Powertech requests updating the text on p. 48 as follows:

Powertech will use a phased approach to wellfield development beginning with wellfield 1 in the Dewey and Burdock Areas. ~~The Burdock B WF1 wellfield and Dewey D WF1 wellfield will be constructed during the initial construction phase of the project.~~ Alternately, Powertech may develop either the Burdock or Dewey wellfields first, followed by those in the other area.

Similarly, Powertech requests updating the text on p. 70 as follows:

Powertech anticipates that the initial construction of processing facilities, infrastructure (e.g., pipelines, access roads, power lines, and storage ponds), and the two initial wellfields is expected to be completed within two years. Powertech will develop the wellfields in a progressive manner, beginning with Dewey and Burdock wellfields #1. Alternately, Powertech may develop the wellfields and processing facilities in either the Dewey or Burdock area first, followed by those in the other area.

In the last sentence in this section, Powertech requests changing the reference from Section 5.4 to Section 4.8, which lists mitigation measures for surface water quality impacts.

The statement is made that the 243 acres of land disturbance anticipated under the deep well liquid waste disposal option includes "initial wellfields." Powertech requests correcting this to "all wellfields" for consistency with Table 10 and Section 6.0.

In the 3rd paragraph, 4th line, Powertech requests correcting a typographical error as follows: "... measures to ensure that injection zone fluids will be vertically confined and injection will not result in the migration of ..."

In list item #5, Powertech requests correcting a typographical error as follows: "Maintain natural contours as much as possible, stabilizing slopes and avoiding unnecessary off-road travel with vehicles; ~~maintaining natural contours as much as possible, stabilizing slopes and avoiding unnecessary off-road travel with vehicles~~."

In the 2nd paragraph, the statement is made that "To mitigate impacts from spills and leaks and to prevent long term impacts, the DENR NPDES permit will require Powertech to develop an Emergency Preparedness Program under the project Environmental Management Plan." Powertech requests correcting this statement to reflect that the Environmental Management Plan is a requirement of the NRC license rather than the DENR NPDES permit. This comment also applies to similar statements on pages 62, 67 and 74.

In the 1st paragraph, 9th line, Powertech requests correcting "2.394 acres" to "2,394 acres".

In the 1st paragraph, last line, Powertech requests correcting "Table 7" to "Table 11".

In the last line in this section, suggest correcting "there should be there should be".

In this last line of the 1st paragraph in this section, Powertech requests correcting "there should be there should be".

wellfield development sequence
refer to Table Figure 1.3: Life of Mine
Schedule in 2015 PEA

C35	76	7.4.1	I
C36	76	7.4.2	C
C37	79	7.6	E
C38	79	7.7	T
C39	80	8.1	C
C40	82	8.2.2	T
C41	83	8.4	E

In the 2nd paragraph, the statement is made that "Powertech estimates the maximum volume of liquid wastes injected into the deep injection wells during aquifer restoration will be 155 gpm (see Section 3.1.1 of this document)." The reference to Section 3.1.1 is for estimated Inyan Kara water consumption during concurrent operations and aquifer restoration, rather than the maximum injection volume. The correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 232 gpm, as stated on page 144 (3rd paragraph) of this document. That amount is consistent with Figure 7.1 of the Class III permit application and Table 5.3-2 of the Large Scale Mine Permit Application. Powertech requests correcting this statement as follows:
Powertech estimates the maximum volume of liquid wastes injected into the deep injection wells during aquifer restoration will be 232 ~~155~~ gpm (see Section 15.3.1~~.1~~ of this document).

In the 1st paragraph in this section, the statement is made that "Powertech estimates that typical liquid waste flow rates during groundwater sweep under the land application option during aquifer restoration will be approximately 507 gpm as shown in Table 5, Section 3.1.2 of this document." Similar to the last comment, the reference to Section 3.1.2 is for estimated Madison usage, not wastewater disposal requirements under the land application option. Figure 7.1 of the Class III permit application and Table 5.3-2 of the Large Scale Mine Permit Application show that the maximum anticipated liquid waste flow rate during concurrent operations and aquifer restoration under the land application option is 582 gpm. Powertech requests correcting this statement as follows:
Powertech estimates that typical liquid waste flow rates during groundwater sweep under the land application option during aquifer restoration will be approximately 582 ~~507~~ gpm as described ~~shown~~ in ~~Table 5,~~ Section 15.3.1~~.1~~.2 of this document.
In bullet #e, Powertech requests clarifying that "Table 5.4-3" refers to the DENR Large Scale Mine Permit Application in the following statement: "The concentrations of metals and metalloids, including arsenic and selenium, are anticipated to be low as shown in Table 5.4-3."
In the 2nd line under Section 7.7, Powertech requests correcting "Section 7.2" to "Section 7.6".
The statement is made that "The Class III injection, production and monitoring wells will have casing screen." As described under comment #29 in Table 1, Section 11.2 of the Class III permit application specifies that the well screen assembly and filter sand may or may not be used. The omission of well screen and filter sand would only be done where the screened interval was sufficiently competent; therefore, there would be no impacts to geology with or without the well screen. Powertech requests deleting this sentence.
In the last paragraph in this section, 3rd line, Powertech requests correcting "injection-induced" to "injection-induced seismicity".
Powertech requests clarification on the statement that "Post-restoration monitoring must have demonstrated that no ISR contaminants have crossed the aquifer exemption boundary" with respect to potential impacts to geology. Any potential impacts to groundwater quality outside of the exempted aquifer would seem to be classified as groundwater impacts rather than geology impacts.

C42	102	10.3.3	C
C43	103	10.4	T
C44	103	10.4	C
C45	104	10.4.1	C

Powertech requests updating the statement that "EPA is considering revisions to 40 CFR Part 61, subpart W" in light of the final rule release in January 2017. It is also suggested to update the discussion to reflect the provisions in the final rule, especially that there are no longer maximum size limits or maximum number of impoundments for non-conventional impoundments such as would be constructed at the Dewey-Burdock Project. Powertech requests clarifying for the public the determination in the final rule that radon emissions from non-conventional impoundments that maintain a minimum liquid level are nearly indistinguishable from background. Since Powertech will treat the wastewater to remove radium and its byproducts, radon emissions from treated water storage ponds will be minimal. Powertech also requests updating the discussion to recognize its November 2014 commitments regarding modifications to the pond designs to comply with final subpart W provisions (**Powertech 2014; Exhibit 032**). In response to a request from EPA staff, Powertech committed to modifying the single-lined wastewater storage and treatment impoundments in the Burdock area to minimize the potential for contamination to reach alluvial groundwater. That letter also documents NRC staff's determination that the existing pond designs are adequately protective of human health and the environment and the NRC license conditions related to pond leak detection monitoring, routine pond inspections and development of a standard operating procedure (SOP) for potential pond releases. In addition, Powertech requests that EPA document Powertech's commitment in its November 2014 letter to submit an application to EPA for approval to construct wastewater storage and treatment impoundments at least 60 days prior to construction of the impoundments. This application was not submitted previously to EPA due to the risk that it would further delay the UIC permitting process, which has already taken more than 8 years yet is incomplete, and due to the uncertainty in the provisions of the final subpart W rule, which was not released until January 2017.

In the numbered list at the top of this page, it appears that the sentence beginning "The presence of Class I areas" should be bullet #3.

In the paragraph above Section 10.4.1, the statement is made that "The peak year accounts for the time when all four ISR project life-cycle phases (construction, operations, aquifer restoration, and decommissioning) are occurring simultaneously and represents the highest amount of emissions the project will generate in any one year." If post-restoration groundwater monitoring is required for this project, it would delay decommissioning by many years if not decades, such that the decommissioning phase would not overlap with any of the other project phases. Therefore, this worst-case scenario would not occur. Powertech requests updating this discussion if post-restoration groundwater monitoring is required.

In the 1st paragraph, the statement is made that "the NRC ... did not use the most recent regulatory-approved version of the [AERMOD and CALPUFF] model software platforms." The AERMOD version used by IML Air Science (IML) in the project modeling was updated by IML's software vendor, Lakes Environmental, multiple times after the original modeling protocol was developed. As a practical matter, any model version is likely to be out of date by the time an EIS is published. This is particularly true when follow-up model runs are required. The important consideration is that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented, and that to preserve comparability the model was not changed mid-stream. Powertech requests updating the discussion to document that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented.

yes - make this change

re-evaluate this

Air Program

C46	104	10.4.1	C
C47	104	10.4.1	C

In the 2nd paragraph, the statement is made that "EPA did not find that NCR [sic] provided sufficient information to support the use of dry depletion in the AERMOD analysis." Precedent has been established by state and federal agencies for using the dry depletion option in AERMOD to model short-term impacts from fugitive dust emissions. For example, a coal lease application in Utah triggered PM10 modeling that included a refined analysis using deposition and plume depletion (IML 2013; Exhibit 033). Page 9 of Appendix K in the Alton Coal Lease DEIS states, "deposition was only considered for assessing the final PM10 modeled ambient air impacts. Deposition was not considered for any other pollutants …" Page 10 states, "the primary pollutants of concern are fugitive dust." (**BLM 2015; Exhibit 034**).

The Colorado Department of Public Health and Environment (CDPHE) uses dry depletion to model PM10 impacts from fugitive dust sources at mining facilities seeking air quality construction permits (**IML 2013; Exhibit 033**). Recent projects for which this option was used include the Lafarge Gypsum Ranch Pit, Oxbow Mining's Elk Creek Mine, and Bowie Resources' Bowie N.2 Mine. The Wyoming Department of Environmental Quality stated that it would accept the use of plume depletion algorithms in AERMOD as long as an applicant justifies the inputs, including particle size, particle density and mass fraction (**IML 2013; Exhibit 033**). Both Colorado and Wyoming operate EPA-approved air permitting and enforcement programs.

A recent modeling analysis was triggered by high fugitive dust impacts in the Salt River area of Arizona. Maricopa County was reclassified as a serious PM10 nonattainment area on June 10, 1996. The primary sources of particulate pollution in this area are "fugitive dust from construction sites, agricultural fields, unpaved parking lots and roads, disturbed vacant lots and paved roads" (IML 2013; Exhibit 033). Cited among the "general characteristics that make AERMOD suitable for application in the Salt River Study area" is the claim that "gravitational settling and dry deposition are handled well." Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph, the statement is made that "The dry depletion option may be appropriate to use in AERMOD when sufficient data are available to determine the particle size distribution and other particle information reasonably well for each source." Powertech asserts that sufficient justification was provided in the IML 2013 modeling (**Exhibit 033**), as summarized below.

The original PM10 particle size distribution was obtained from the modeling protocol for the Rosemont Mine in Arizona (IML 2013; Exhibit 033). The modelers for the Rosemont project acquired this distribution from AP-42 Section 13.2.4 and applied it to fugitive dust emissions from haul roads. Because Section 13.2.4 applies to aggregate handling and storage piles, other sources were consulted to validate the use of this particle size distribution for haul road dust. A study by Watson, Chow and Pace referenced in a New Jersey Department of Environmental Protection report found that 52.3% of the particulate from road and soil dust is less than 10 µm in diameter. Of this particulate 10.7% was found to be smaller than 2.5 µm in diameter and the remaining 41.6% fell between 10 and 2.5 µm. Assuming that fugitive dust particle sizes follow a lognormal distribution, these two data points were transformed into a multi-point particle size distribution for comparison to the original particle size distribution. The geometric mass mean diameter for the original distribution is 6.47 µm, while the mean diameter for the lognormal distribution is 5.76 µm. EPA's AP-42 Section 13.2.2 and supporting studies characterize PM30 from unpaved road dust (the dominant source at Dewey-Burdock) as 30.6% PM10 and 3.06% PM2.5. Again, assuming a lognormal particle size distribution, the mean diameter would be 6.77 µm. CDPHE has approved a mean coarse particle diameter for road dust of 6.25 µm (Trinity 2016; Exhibit 035). Since these values are clustered around the original PM10 size distribution, it was retained for both CALPUFF and AERMOD dry deposition modeling.

Air Program

C47 Cont			
C48	104	10.4.1	E
C49	104	10.4.1	E
C50	110	10.4.2.1	E
C51	111	10.4.2.2	T

As stated above, the mass mean diameter of PM10 particles with the chosen size distribution referenced above is 6.47 µm, or approximately 65% of the top diameter. Applying this ratio would yield about 1.5 µm for the mean PM2.5 particle size. Hence, the choice of 1 µm mean particle size diameter for PM2.5 was conservative in that it increases atmospheric entrainment and decreases settling. In contrast to PM10 modeling, the plume depletion option had only a minor effect on modeled PM2.5 impacts.

Aluminosilicate clay minerals that characterize soil dust in the project area typically have particle density near 2.65 g/cm3. As indicated in IML's final report (IML 2013; Exhibit 033), the Environmental Science Division of Argonne National Lab states, "A typical value of 2.65 g/cm3 has been suggested to characterize the soil particle density of a general mineral soil. Aluminosilicate clay minerals have particle density variations in the same range." Another study of fugitive dust from unpaved road surfaces, by Watson and Chow, also cites 2.65 g/cm3 for soil particle density (IML 2013; Exhibit 033). In a more recent analysis, the CDPHE-approved particle density for road dust is 2.655 g/cm3 (Trinity 2016; Exhibit 035). Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph, the statement is made that "dry depletion should have been applied to all receptors within the model domain." Using the dry depletion option, IML modeled all receptors with predicted 24-hour PM10 impacts in the initial modeling run that, when added to background, were greater than the NAAQS of 150 µg/m3. This threshold was chosen to demonstrate ultimate compliance of all initially high receptors. The regulatory default settings were used to screen potential problem receptors, and the dry depletion option was used to refine the model results only for those receptors. Since the dry depletion option has the effect of reducing (never increasing) predicted impacts, it was deemed unnecessary to apply this option to receptors already demonstrated to be below the NAAQS threshold. The predicted concentrations would only have decreased beyond those obtained under the regulatory default option. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 3rd paragraph, the statement is made that "the approach used by NRC will not account for the diesel engine exhaust PM10 particles that will not settle out as quickly as the mechanically generated fugitive dust emissions." Most of the non-fugitive sources of particulate emissions at Dewey-Burdock are diesel engines. EPA is correct that some error may be introduced by including combustion sources of PM10 in the dry depletion runs. Most particulate matter in diesel exhaust falls within the PM2.5 category and exhibits a much slower deposition rate than PM10. Nonetheless, fugitive sources are dominant at Dewey-Burdock, where diesel exhaust constitutes only 1% of the total PM10 emissions. For this reason, and to avoid further complicating the final model run, IML grouped all PM10 sources together. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.
With regard to the 24-hour PM10 modeling results, the statement is made in the 1st paragraph that "the top 3 values are of interest regardless of when they occurred." For compliance demonstration, the standard design value is the 4th high concentration over a 3-year period. This value is shown in Table 6-1 (**IML 2013; Exhibit 033**) and should not be confused with the yearly statistics also presented in that table. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the second line, Powertech requests correcting the reference to "Table 11a", which does not appear in this section.

Air Program

Air Program

Air Program

Air Program

make this change

C52	111	10.4.2.4	E

C52
Cont

C53	113	10.5	T
C54	114	10.6	T
C55	114	10.6.1	E

C55
Cont

In the 1st paragraph in this section, the statement is made that "IML and NRC determined there is evidence and precedent that supports excluding ground-level, fugitive PM10 emissions from the assessment of project impacts on visibility at Wind Cave … However, EPA did not support this approach for the SEIS." As stated in the final report (IML 2013; Exhibit 033) and acknowledged by EPA, even without excluding coarse particulates, the 98th percentile of the annual 24-hour average changes in haze index is less than the contribution threshold of 0.5 dv. Still, IML conducted a final model run excluding coarse PM10 for several reasons:

- CALPUFF predicted that 70% of visibility impairment at Wind Cave from the Dewey-Burdock Project was caused by coarse PM10. This goes against visibility modeling results obtained by various agencies including South Dakota DENR. Aerosols of sulfate and nitrate, organic carbon, and fine particulates (PM2.5) are generally the significant contributors to visibility impairment.
- To test the reasonableness of the modeled impact of coarse particulates on visibility at Wind Cave, IML used CALPUFF to model the impact of PM10 coarse emissions from Dewey-Burdock at three test receptors (IML 2013; Exhibit 033). The receptors were placed 40, 80, and 116 km from the project, respectively. CALPUFF predicted higher relative contribution from coarse PM10 as the distance from the project to the receptor increased. This outcome defies common sense and exposes the fallacy of modeling visibility without accounting for near-field deposition of coarse PM10.
- Notwithstanding EPA's challenge to the evidence and precedent appearing in the final report, the modeling protocol does cite NEPA precedent for excluding fugitive dust emissions from visibility impact modeling. This approach was followed in the Atlantic Rim EIS (IML 2013; Exhibit 033), which cited supporting documentation from the Western Regional Air Partnership (WRAP).
- A 2005 study (VISTAS 2005; Exhibit 036 at p. 3-13) states, "PM2.5 particles, which have a mass median diameter around 0.5 µm, have an average net deposition velocity of about 1 cm/minute … On the other hand, coarse particles … have an average deposition velocity of about 1 m/minute, which is significant, even for emissions from elevated stacks." It seems unreasonable to model the long-range transport of both species as if they behaved the same.

Regarding exclusion of coarse particulates from stationary sources: It should be noted that stationary sources at Dewey-Burdock are combustion sources with negligible emissions compared to mobile sources and fugitive dust sources. Moreover, particulates from stationary combustion sources are 97% PM2.5 (IML 2013; Exhibit 033) and were already accounted for since only coarse PM10 was omitted from the final visibility model run. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 6th line of this sentence, Powertech requests changing "in this SEIS" to "in the NRC SEIS".

The last sentence in this section appears incomplete: "If Powertech does not implement one or more of these measures properly …"

In the 2nd paragraph in this section, the statement is made that "the Dewey-Burdock project has not been shown to greatly effect [sic] regional cumulative air quality." This should be expected, given the comparison between project emission levels and regional emissions. Since fugitive PM10 emissions from Dewey-Burdock constitute the largest single pollutant, and since EPA's analysis takes issue with the degree of conservatism in modeling fugitive PM10 impacts on air quality and visibility, the following table may lend some perspective:

Area Encompassed	Fugitive Emission Sector(s)	PM10 Emissions (tons/year)
State of Wyoming	Unpaved Road Dust	421,044
State of Wyoming	Mining Dust	93,331
State of Wyoming	Crops and Livestock Dust	39,112
State of South Dakota	Crops and Livestock Dust	333,119
State of South Dakota	Unpaved Road Dust	77,273

Air Program

make this change
complete this sentence

C56	114	10.6.2	T
C57	117	11.3	C
C58	119	11.3.1	E
C59	119	11.3.2	T
C60	121	Tables 33-34	T
C61	122	11.4	E
C62	130	12.1	T
C63	133	12.2	C
C64	133	12.3	T
C65	134	12.5	C

State of South Dakota	Unpaved Road Dust	77,273
Dewey-Burdock Permit Area and County Road	All Fugitive Dust Sources (max. year)	458

Source: EPA 2017; Exhibit 037

groundwater monitoring, if required. As described in Attachment A-3, post-restoration groundwater monitoring could require decades or hundreds of years of additional sampling, which would also involve mechanical integrity testing and providing electrical power and maintenance within the Central Processing Plant and Satellite Facility. It does not appear that greenhouse gas emissions associated with the post-restoration groundwater monitoring period have been considered.

In the first paragraph, the statement is made that "the year one facility construction does not appear to be distinguishable in the estimation of CO2 emissions related to electrical power consumption during the construction phase." Powertech notes that the GHG emissions from year 1 construction amount to about 0.2% of the cumulative, project GHG emissions. For clarity, however, most of the electricity consumed during the Dewey-Burdock construction phase will be for facilities construction, where utility power will be available. Wellfield construction will involve primarily mobile and earth-moving equipment to drill wells and install piping and power lines. Electricity use in the wellfields will correspond mainly to the operations phase. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the first paragraph in this section, 5th line, Powertech requests correcting "whither" to "either".

It appears that metric tons and short tons are switched in several rows (i.e., those where the metric tons are higher than the short tons). Powertech recommends correcting these tables.

In the 4th paragraph, the statement is made that the NRC SEIS does not include any information about GHG emissions during the uranium enrichment phase. Enrichment is downstream from the Dewey-Burdock Project. IML considered the analysis of this phase beyond the scope of the SEIS just as it did the analysis of an ultimate use for the enriched uranium (i.e., nuclear power plants). EPA acknowledges, and many studies support the net reduction in life-cycle GHG emissions achieved by nuclear power when it displaces fossil fuel power. Notably, the GHG reporting rule does not include uranium enrichment facilities or nuclear power plants among the 41 industrial sectors required to report. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In lines 4-6, it appears that references to "Table 29" should be changed to "Table 36".

In the 1st paragraph, the statement is made that Powertech proposes to store, use, and receive shipments of anhydrous ammonia (NH3). Powertech does not propose to use ammonia at the Dewey-Burdock Project. Figure 3.2-6 in the approved NRC license application shows that sodium hydroxide will be used in the precipitation circuit instead. Table 3.2-1 in the approved NRC license application, which lists the process-related chemicals and quantities planned for the project, likewise does not include ammonia. Powertech requests removing mention of anhydrous ammonia from this paragraph.

In the 2nd paragraph in this section, 1st line, Powertech requests correcting "Table 30" to "Table 38".

The statement is made that "Because the Dewey Road is a county road, presumably it is maintained by Custer and Fall River Counties." These counties do maintain their respective portions of the Dewey Road. Moreover, Powertech executed an agreement with Fall River County to provide equipment, materials, and/or financial assistance to cover a portion of the total road maintenance cost for Fall River County roads used by Powertech during construction and operation (Powertech 2007; **Exhibit 038**). Powertech requests revision of the text to reflect this commitment.

make this change

GHG

GHG

make this change
make this change

C66	135? or 136	13.1	C
C67	135? or 136	13.1	I
C68	140	14.3	E
C69	144	15.3.1	C, I
C70	144	15.3.1	C
C71	144	15.3.2	C
C72	145	15.3.4	C
C73	146	15.4.1	C

In the 1st sentence in this section, the statement is made that NRC evaluated the impacts of transporting "yellowcake slurry." Slurry is an intermediate product in the yellowcake production cycle that is dried to produce the final yellowcake product. This is described in Section 3.2.3.1 of the SER: "The CPP will also contain 2 vacuum dryers for drying yellowcake slurry into its final powder form" (Exhibit 014 at p. 96). Powertech requests removing the word "slurry" since yellowcake slurry will not be shipped from the Dewey-Burdock Project site.
In the 2nd line, Powertech requests changing "radioactive wastes" to "byproduct material" for consistency with other sections of this document (e.g., Section 12.2).
A discussion is included about traditional subsistence practices such as hunting and wild plant gathering. Powertech suggests mentioning that the entire Dewey-Burdock permit area is either private land or BLM-managed federal land for which no public access roads exist. Therefore, there is no plausible use of lands within the proposed permit area for "traditional subsistence practices and the procurement of animals and plants for ritual, ceremonial, medicinal and other traditional needs." Powertech requests the addition of text to indicate that there is no public access to lands within the proposed permit area.
In the 1st paragraph, the statement is made that the maximum liquid byproduct material quantity requiring disposal in the deep well injection option will be 197 gpm. As described in comment #C35 and as correctly listed in the 3rd paragraph in this section, the correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 232 gpm. Powertech requests correcting the maximum liquid waste generation rate in the deep disposal well option from "197 gpm" to "232 gpm".
In the 2nd paragraph, the statement is made that "Powertech proposed the construction of two Minnelusa injection wells, DW No. 1 in the Burdock Area and DW No. 3 in the Dewey Area." This does not appear to be consistent with the Class V permit application or Draft Class V Area Permit, both of which discuss up to four Minnelusa injection wells. Powertech requests updating the discussion to account for the four Class V injection wells included in the Class V Area Permit.

In the 1st paragraph in this section, the statement is made that the maximum production of liquid byproduct material in the land application option will be 547 gpm. As described in comment #C36, the correct maximum volume of liquid waste injection during concurrent operations and aquifer restoration is 582 gpm. Powertech requests correcting the maximum liquid waste generation rate in the land application option from "547 gpm" to "582 gpm".
Powertech requests clarifying that the 66 cubic yards of solid byproduct material is an annual estimate during operations. This comment also applies to Section 15.4.4.

The statement is made that "Powertech proposes to manage aquifer restoration wastewater (i.e., liquid byproduct material) by treating the wastewater by reverse osmosis and reinjecting the treated water (i.e., permeate) back into the aquifer production zone undergoing restoration as described in SEIS Section 2.1.1.1.4.1" (emphasis added). Powertech requests clarification that the water withdrawn from the wellfields during groundwater restoration is not wastewater; it is treated by reverse osmosis (in the deep disposal well option), and the resulting reject is treated and disposed as wastewater. The water withdrawn from the wellfield and the treated water (permeate), while still considered 11e.(2) byproduct materials under NRC regulation, are not wastewater. Powertech requests modifying this sentence as follows: Powertech proposes to manage water pumped from the ISR wellfields during aquifer restoration ~~waste~~water (i.e., liquid byproduct material) by treating the ~~waste~~water by reverse osmosis and reinjecting the treated water (i.e., permeate) back into the aquifer production zone undergoing restoration as described in SEIS Section 2.1.1.1.4.1.

C74	146	15.4.2	E
C75	147	15.5.1	C
C76	148	15.5.2	E
C77	149	15.5.4	T
C78	149	15.6	C
C79	150	15.6	T
C80	150	16.0	T

In the 11th line in this section, the statement is made that "The NRC, the DENR and the EPA will require liquid byproduct material be treated prior to injection and treatment systems be approved, constructed, operated, and monitored to ensure release standards ... are met." Powertech is not aware that EPA has any permit requirements for the land application of treated wastewater and requests clarification on this statement or removal of EPA from the list of agencies authorizing land application.
Regarding the statement that Powertech expects to install 4,000 injection and production wells, please refer to comment #E1 in Table 3, which describes how Powertech currently estimates that approximately 1,461 injection wells and 869 production wells will be required over the life of the project.
Powertech requests explanation of the reference for the statement that "The NRC will update this evaluation as part of the pre-operational analysis for the Dewey-Burdock Project Site, and certify that binding contractual arrangements and commitments for providing capacity for the proposed Dewey-Burdock ISR Project have been made with one or both of these landfill options prior to beginning construction."
In the 2nd paragraph, last line, Powertech requests correcting "Section 14.3.1" to "Section 15.3.1".

The statement is made that "Powertech will be required to have an agreement in place with White Mesa Mill for the disposal of solid by-product waste." Although White Mesa Mill has been identified as the preferred location for disposal of solid byproduct material, the NRC license does not require an agreement with any particular 11e.(2) byproduct material disposal facility. The requirements in NRC License Conditions 12.6 and 9.9, as stated on page 150 of this document, require Powertech to submit to the NRC a disposal agreement with a licensed disposal site before beginning operations and to maintain an agreement throughout operations. Powertech requests revising this sentence as follows:

Before the NRC will authorize commencement of ISR operations, Powertech will be required to have an agreement in place with a facility that is licensed by the NRC or an NRC Agreement State to receive byproduct material, such as the White Mesa Mill ~~for the disposal of solid by-product waste~~.
In the last paragraph in this section, 3rd line, Powertech requests deleting "76" in "76 License Condition 9.9 ..."

In the 1st paragraph in this section, 7th line, Powertech requests correcting "Table 32" to "Table 39".

No.	Page	Section	Type
C45	104	10.4.1	C
C46	104	10.4.1	C

Comment and Requested Modification

Powertech's Comment type key:
A – alternate approach proposed;
C – correct to be consistent with application, regulations or NRC license requirements;
E – additional explanation requested;
I – inconsistency (internally inconsistent between parts of Draft permit or supporting documents);
R – remove; inconsistent with application, regulations or NRC license requirements;
T – typographical error

In the 1st paragraph, the statement is made that "the NRC … did not use the most recent regulatory-approved version of the [AERMOD and CALPUFF] model software platforms." The AERMOD version used by IML Air Science (IML) in the project modeling was updated by IML's software vendor, Lakes Environmental, multiple times after the original modeling protocol was developed. As a practical matter, any model version is likely to be out of date by the time an EIS is published. This is particularly true when follow-up model runs are required. The important consideration is that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented, and that to preserve comparability the model was not changed mid-stream. Powertech requests updating the discussion to document that the versions of AERMOD and its associated software tools were current and mutually compatible when the model was implemented.

In the 2nd paragraph, the statement is made that "EPA did not find that NCR [sic] provided sufficient information to support the use of dry depletion in the AERMOD analysis." Precedent has been established by state and federal agencies for using the dry depletion option in AERMOD to model short-term impacts from fugitive dust emissions. For example, a coal lease application in Utah triggered PM10 modeling that included a refined analysis using deposition and plume depletion (**IML 2013; Exhibit 033**). Page 9 of Appendix K in the Alton Coal Lease DEIS states, "deposition was only considered for assessing the final PM10 modeled ambient air impacts. Deposition was not considered for any other pollutants …" Page 10 states, "the primary pollutants of concern are fugitive dust." (**BLM 2015; Exhibit 034**).

The Colorado Department of Public Health and Environment (CDPHE) uses dry depletion to model PM10 impacts from fugitive dust sources at mining facilities seeking air quality construction permits (**IML 2013; Exhibit 033**). Recent projects for which this option was used include the Lafarge Gypsum Ranch Pit, Oxbow Mining's Elk Creek Mine, and Bowie Resources' Bowie N.2 Mine. The Wyoming Department of Environmental Quality stated that it would accept the use of plume depletion algorithms in AERMOD as long as an applicant justifies the inputs, including particle size, particle density and mass fraction (**IML 2013; Exhibit 033**). Both Colorado and Wyoming operate EPA-approved air permitting and enforcement programs.

A recent modeling analysis was triggered by high fugitive dust impacts in the Salt River area of Arizona. Maricopa County was reclassified as a serious PM10 nonattainment area on June 10, 1996. The primary sources of particulate pollution in this area are "fugitive dust from construction sites, agricultural fields, unpaved parking lots and roads, disturbed vacant lots and paved roads" (IML 2013; Exhibit 033). Cited among the "general characteristics that make AERMOD suitable for application in the Salt River Study area" is the claim that "gravitational settling and dry deposition are handled well." Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

EPA Response

C47 104 10.4.1 C

C47
Cont

In the 2nd paragraph, the statement is made that "The dry depletion option may be appropriate to use in AERMOD when sufficient data are available to determine the particle size distribution and other particle information reasonably well for each source." Powertech asserts that sufficient justification was provided in the IML 2013 modeling (**Exhibit 033**), as summarized below.

The original PM10 particle size distribution was obtained from the modeling protocol for the Rosemont Mine in Arizona (**IML 2013; Exhibit 033**). The modelers for the Rosemont project acquired this distribution from **AP-42** Section 13.2.4 and applied it to fugitive dust emissions from haul roads. Because Section 13.2.4 applies to aggregate handling and storage piles, other sources were consulted to validate the use of this particle size distribution for haul road dust. A study by **Watson, Chow and Pace** referenced in a New Jersey Department of Environmental Protection report found that 52.3% of the particulate from road and soil dust is less than 10 µm in diameter. Of this particulate 10.7% was found to be smaller than 2.5 µm in diameter and the remaining 41.6% fell between 10 and 2.5 µm. Assuming that fugitive dust particle sizes follow a lognormal distribution, these two data points were transformed into a multi-point particle size distribution for comparison to the original particle size distribution. The geometric mass mean diameter for the original distribution is 6.47 µm, while the mean diameter for the lognormal distribution is 5.76 µm. EPA's AP-42 Section 13.2.2 and supporting studies characterize PM30 from unpaved road dust (the dominant source at Dewey-Burdock) as 30.6% PM10 and 3.06% PM2.5. Again, assuming a lognormal particle size distribution, the mean diameter would be 6.77 µm. CDPHE has approved a mean coarse particle diameter for road dust of 6.25 µm (**Trinity 2016; Exhibit 035**). Since these values are clustered around the original PM10 size distribution, it was retained for both CALPUFF and AERMOD dry deposition modeling.

As stated above, the mass mean diameter of PM10 particles with the chosen size distribution referenced above is 6.47 µm, or approximately 65% of the top diameter. Applying this ratio would yield about 1.5 µm for the mean PM2.5 particle size. Hence, the choice of 1 µm mean particle size diameter for PM2.5 was conservative in that it increases atmospheric entrainment and decreases settling. In contrast to PM10 modeling, the plume depletion option had only a minor effect on modeled PM2.5 impacts.

Aluminosilicate clay minerals that characterize soil dust in the project area typically have particle density near 2.65 g/cm3. As indicated in IML's final report (IML 2013; Exhibit 033), the Environmental Science Division of Argonne National Lab states, "A typical value of 2.65 g/cm3 has been suggested to characterize the soil particle density of a general mineral soil. Aluminosilicate clay minerals have particle density variations in the same range." Another study of fugitive dust from unpaved road surfaces, by Watson and Chow, also cites 2.65 g/cm3 for soil particle density (**IML 2013; Exhibit 033**). In a more recent analysis, the CDPHE-approved particle density for road dust is 2.655 g/cm3 (Trinity 2016; Exhibit 035). Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

found 2:
Watson et al., 1991 J.G. Watson, J.C. Chow, T.G. Pace Chemical mass balance P.K. Hopke (Ed.), Receptor Modeling for Air Quality Management, Elsevier Press, New York, NY (1991), pp. 83-116

J.G. Watson, J.C. Chow, T.G. Pace Fugitive dust emissions W.T. Davis (Ed.), Air Pollution Engineering Manual, Van Nostrand Reinhold, New York, NY (2000), pp. 117-134

probably second one; downloaded reference

C48 104 10.4.1 E

C49 104 10.4.1 E

C50 110 10.4.2.1 E

In the 2nd paragraph, the statement is made that "dry depletion should have been applied to all receptors within the model domain." Using the dry depletion option, IML modeled all receptors with predicted 24-hour PM10 impacts in the initial modeling run that, when added to background, were greater than the NAAQS of 150 µg/m3. This threshold was chosen to demonstrate ultimate compliance of all initially high receptors. The regulatory default settings were used to screen potential problem receptors, and the dry depletion option was used to refine the model results only for those receptors. Since the dry depletion option has the effect of reducing (never increasing) predicted impacts, it was deemed unnecessary to apply this option to receptors already demonstrated to be below the NAAQS threshold. The predicted concentrations would only have decreased beyond those obtained under the regulatory default option. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 3rd paragraph, the statement is made that "the approach used by NRC will not account for the diesel engine exhaust PM10 particles that will not settle out as quickly as the mechanically generated fugitive dust emissions." Most of the non-fugitive sources of particulate emissions at Dewey-Burdock are diesel engines. EPA is correct that some error may be introduced by including combustion sources of PM10 in the dry depletion runs. Most particulate matter in diesel exhaust falls within the PM2.5 category and exhibits a much slower deposition rate than PM10. Nonetheless, fugitive sources are dominant at Dewey-Burdock, where diesel exhaust constitutes only 1% of the total PM10 emissions. For this reason, and to avoid further complicating the final model run, IML grouped all PM10 sources together. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

With regard to the 24-hour PM10 modeling results, the statement is made in the 1st paragraph that "the top 3 values are of interest regardless of when they occurred." For compliance demonstration, the standard design value is the 4th high concentration over a 3-year period. This value is shown in Table 6-1 (**IML 2013; Exhibit 033**) and should not be confused with the yearly statistics also presented in that table. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

C52 111 10.4.2.4 E

C52
Cont

C55 114 10.6.1 E

C55
Cont

In the 1st paragraph in this section, the statement is made that "IML and NRC determined there is evidence and precedent that supports excluding ground-level, fugitive PM10 emissions from the assessment of project impacts on visibility at Wind Cave ... However, EPA did not support this approach for the SEIS." As stated in the final report (**IML 2013; Exhibit 033**) and acknowledged by EPA, even without excluding coarse particulates, the 98th percentile of the annual 24-hour average changes in haze index is less than the contribution threshold of 0.5 dv. Still, IML conducted a final model run excluding coarse PM10 for several reasons:

- CALPUFF predicted that 70% of visibility impairment at Wind Cave from the Dewey-Burdock Project was caused by coarse PM10. This goes against visibility modeling results obtained by various agencies including South Dakota DENR. Aerosols of sulfate and nitrate, organic carbon, and fine particulates (PM2.5) are generally the significant contributors to visibility impairment.
- To test the reasonableness of the modeled impact of coarse particulates on visibility at Wind Cave, IML used CALPUFF to model the impact of PM10 coarse emissions from Dewey-Burdock at three test receptors (**IML 2013; Exhibit 033**). The receptors were placed 40, 80, and 116 km from the project, respectively. CALPUFF predicted higher relative contribution from coarse PM10 as the distance from the project to the receptor increased. This outcome defies common sense and exposes the fallacy of modeling visibility without accounting for near-field deposition of coarse PM10.
- Notwithstanding EPA's challenge to the evidence and precedent appearing in the final report, the modeling protocol does cite NEPA precedent for excluding fugitive dust emissions from visibility impact modeling. This approach was followed in the Atlantic Rim EIS (**IML 2013; Exhibit 033**), which cited supporting documentation from the Western Regional Air Partnership (WRAP).
- A 2005 study (**VISTAS 2005; Exhibit 036 at p. 3-13**) states, "PM2.5 particles, which have a mass median diameter around 0.5 µm, have an average net deposition velocity of about 1 cm/minute ... On the other hand, coarse particles ... have an average deposition velocity of about 1 m/minute, which is significant, even for emissions from elevated stacks." It seems unreasonable to model the long-range transport of both species as if they behaved the same.

Regarding exclusion of coarse particulates from stationary sources: It should be noted that stationary sources at Dewey-Burdock are combustion sources with negligible emissions compared to mobile sources and fugitive dust sources. Moreover, particulates from stationary combustion sources are 97% PM2.5 (**IML 2013; Exhibit 033**) and were already accounted for since only coarse PM10 was omitted from the final visibility model run. Powertech requests that EPA update this discussion in light of the evidence presented in this comment.

In the 2nd paragraph in this section, the statement is made that "the Dewey-Burdock project has not been shown to greatly effect [sic] regional cumulative air quality." This should be expected, given the comparison between project emission levels and regional emissions. Since fugitive PM10 emissions from Dewey-Burdock constitute the largest single pollutant, and since EPA's analysis takes issue with the degree of conservatism in modeling fugitive PM10 impacts on air quality and visibility, the following table (from **Exhibit 037** EPA NEI Emissions Data 2014 WY SD) may lend some perspective:

Si / be
m lock
re uth
D sented
ir

Area Encompassed	Fugitive Emission Sector(s)	PM10 Emissions (tons/year)
State of Wyoming	Unpaved Road Dust	421,044
State of Wyoming	Mining Dust	93,331
State of Wyoming	Crops and Livestock Dust	39,112
State of South Dakota	Crops and Livestock Dust	333,119

Source Document ID	Commenter
00546	Troy S Weston President Oglala Sioux Tribe
00546	Troy S Weston President Oglala Sioux Tribe
00546	Troy S Weston President Oglala Sioux Tribe

Comment

This actual risk posed to water quality in the Cheyenne River watershed is likewise discounted in EPA's Draft Cumulative Effects Analysis. The analysis fails to calculate the cornbined impact of the risk posed by the Dewey-Burdock wells with the impoundment of the Cheyenne River at the Bureau of Reclamation Angostura Unit. Angostura Dam dirp_inishes the water flows of the Cheyenne River on the Pine Ridge Indian Reservation. It interrupts the high spring flows needed for cottonwood regeneration, diminishing the abµndance of important plant species µsed by the Lakota people in ceremonies. Operation of the dam also degrades wildlife habitat on the Pine Ridge Indian Reservation. The return flows from irrigation contain pesticides, heavy metals, and sodium.

According to the South Dakota Department of Environment and Natural Resources:
The Cheyenne River water quality continues to be generally poor, due to both natural and agricultural sources ... During normal or lower flow periods, the upper Cheyenne often exceeds irrigation water quality standards for specific conductance and sodium absorption ratio.
(SD DENR, 2016 Integrated Report for Surface Water Quality, p. 89).
Dewey-Burdock imposes additional risk to an already-impaired Cheyenne River watershed. The cumulative impact of the risk posed by the injection of waste from in situ Uranium extraction with the degradation caused by the Angostura Unit is necessary. However, the EPA Draft Cumulative Effects Analysis fails to do so.

Moreover, the accumulation of heavy metals and radionuclides at Angostura must be taken into account by EPA. According to Sharma, et al:
Delta sediments of Angostura Reservoir were markedly enriched in V, Zn, and U. Uranium was also elevated from the mine spoil and drainages at near U mines sampled near Dewey ... Generally, elevated heavy metal concentration existed in both the upper and lower reaches of the Cheyenne River catchment, with higher concentration in the upper reaches indicative of rapid sedimentation processes.
Rohit Sharma, et al, Stream Sediment Geochemistry of the Upper Cheyenne River Watershed within the Abandoned Uranium Mining Region of the Southern Black Hills, South Dakota, USA, ENVIRON. EARTH. SCI. (2016) 75:823.
Thus, researchers from the S.D. School of Mines and Technology have uncovered that uranium and mining waste have contaminated the upper Cheyenne River. Contaminants have migrated to Angostura Reservoir, and the active transportation process threatens the Pine Ridge Indian Reservation downstream. The EPA fails to give adequate consideration to the combined risk posed by this pollution with the proposed injection of mining waste at Dewey-Burdock. As a result, the Draft Cumulative Effects Analysis fails to accurately describe the risk posed to the Oglala Sioux Tribe.
Ultimately, the proposed Dewey-Burdock injection wells pose a risk of potential migration of injectate, through faults and secondary porosity in areas connecting with artesian springs. As a result, the proposed waste injection project directly jeopardizes the waters of the Oglala Sioux Tribe. EPA must deny the Dewey-Burdock permit.

EPA Notes/Response

00527 Lilias Jones Jarding,
Ph.D.
Clean Water
Alliance

00500, 00501 Rodney Knudson

00500, 00501 Rodney Knudson

Moving to the nature of the ISL uranium industry, the Fact Sheets and Cumulative Effects documents do not discuss the uranium industry's record in relation to problems with the ISL process at other sites. This minimizes the many problems that the ISL industry has experienced and, thus, the potential problems from the Dewey-Burdock project. This makes the portions of the draft permit dealing with excursions and leaks inadequate, as well as sections about mitigation and reclamation.

If EPA staff look over the information about ISL mines and regulation at http://www.wise-uranium.org/umopusa.html (WISE Uranium, "Issues at Operating Uranium Mines and Mills – USA," last updated April 19, 2017), it quickly becomes clear that excursions are "normal," as the former CEO of Powertech said in a public forum in Colorado, and that leaks of both pipelines and ponds are common. This indicates that both surface and ground water are at risk.

This source also documents the movement of mining fluid beyond the mine boundary at the Kingsville Dome ISL mine in Texas (Rice. 2013. "Excursions of Mining Solution at the Kingsville Dome In-Situ Leach Uranium Mine." Austin Geological Society Bulletin) and the Highland Uranium Project in Wyoming. A summary of this type of information can also be found at Daniel Simmons-Ritchie, "Troubled history" in the Rapid City Journal. September 23, 2013. A history of these issues in the northern Plains region can be found in Jarding. 2011. Uranium Activities' Impacts on Lakota Territory, Indigenous Policy Journal.

Yesterday I printed off the 151 page EPA summation entitled "Draft Cumulative Effects Analysis of the Dewey-Burdock Uranium in-situ Recovery, Underground Injection Control Area Permits" and took most of the day to read it because I wanted to be as fair as I could be about this process. The report painted a rather benign picture of the mining process ending with kudos for the small carbon footprint left by the power plants that produced the electricity from the enriched uranium. Not mentioned was the enormous amounts of electricity required to isolate U234, U235 from U238 generated by coal or gas fired power plants but more importantly the toxic products of this process that we are creating with no safe place to put them. The entire nuclear industry has left behind a toxic nightmare that has to be dealt with and has been systematically ignored and made the responsibility for a future generation.

What I see is the worst part of this question though is that the mining phase is just the start of a horrifying development that results in ever more toxic next phases of the uranium story. The UF6 leaks in the separation phase, the electrical generation using the enriched/blended U235, the military uses that have poisoned countless people worldwide from the fallout and bio-accumulation of radioactive nuclides especially Cs137, Sr90, 1131, Pu239 et.al. producing cancers; such as, lymphoma/leukemia, bone, pancreatic, liver, lung brain, colon, skin and breast which has seen dramatic increases after the 1300 open air nuclear tests. Exploding nuclear power plants like Three Mile Island, Chernobyl and now Fukushima which is an ongoing disaster that won't be stabilized for 40 to a 100 years ...military uses

00527 Lilias Jones Jarding, Ph.D. Clean Water Alliance

00519 Black Hills Clean Water Alliance several people listed

00527 Lilias Jones Jarding, Ph.D. Clean Water Alliance

00527 Lilias Jones Jarding, Ph.D. Clean Water Alliance

00527 Lilias Jones Jarding, Ph.D. Clean Water Alliance

According to communication you had with Fall River County Commissioner Joe Allen on March 24, 2017, the current draft Class V permit would allow other ISL uranium mines to send wastes for disposal at the Dewey-Burdock site. These wastes could arrive without documentation or information on the origin of the wastes. First of all, wastes should not be brought to the Dewey-Burdock site from other sites under any conditions. This adds transportation risks to the scenario and makes our area a dumping ground. It is our position that pertinent South Dakota Statutes forbid this, and consideration and analysis of these laws should be part of the draft permit review process.
Second, if outside wastes are allowed to be brought to Dewey-Burdock, then their chemical composition, location of origin, mine of origin, company of origin, and other pertinent information should be required to be reviewed by EPA before transportation to Dewey-Burdock begins. This information should also be public, so people know what is arriving in our area. Testing should be required upon arrival to insure that the waste meets Class V water quality standards. All of this should have been part of the draft permits and Cumulative Effects Analysis. This is another example of why the current analysis is grossly incomplete.

The EPA also omits important issues from its Draft Cumulative Effects Analysis. Two that are glaring are
1) the potential for mining wastes to be transported from other areas to Dewey-Burdock Class V wells and
2) the potential for uranium mining to expand onto Powertech/Azarga's contiguous claims on the Wyoming side of the state line (the Dewey Terrace project). It's important to consider climate change, but it's also important to consider cumulative impacts that are on or adjacent to the proposed mine site.

The next omission is that the treatment of radiological wastes from the drying cycle at the Central Processing Plant is not specified. The Cumulative Effects Analysis says that "off-gases generated during the drying cycle will be filtered through a baghouse" (p. 86), and it also mentions a "sock filter" (p. 87). However, the document does not give any information on where or how the wastes in the filters/baghouse would be disposed. It is assumed that these wastes will be radioactive, so should probably be 11e wastes. But readers (and the company) should not have to guess about such things.

This situation should be the subject of comprehensive analysis, and the entire waste cycle should be specified clearly.

There is also no discussion of potential accidents during processing (which have occurred) or the remediation or mitigation that might be needed as a result.

Much of the mitigation sections appears to be vague, incomplete, or based on stock language picked from other documents, such as the discussion of soil impacts mitigation on page 78-79 of the Cumulative Effects Analysis. The mitigation sections of EPA documents should offer a complete and detailed analysis of the required mitigation that is site specific at the Dewey-Burdock location.
To top it off, the EPA makes use of the Draft Cumulative Effects Analysis difficult, as the document has neither a Table of Contents nor an Index. In the future – and before further action is taken on the proposed mine, Class V wells, and aquifer exemption -- we hope that the EPA will rectify this and the other omissions.

Not needed - the updated permits will include restriction to disposal of treated ISR waste fluids generated at the Dewey-Burdock site.

1) Addressed by the updated permits including restriction to disposal of treated ISR waste fluids generated at the Dewey-Burdock site.
2) Do we need to take development of the Dewey Terrace across the state line in WY into consideration?

15.0 IMPACTS FROM WASTE MANAGEMENT section includes a number of sections on 11e(2) byproduct waste for each phase of the project taken from the SEIS, although these filters aren't specifically mentioned.

13.2 Other Types of Potential Accidents

I will include a Table of Contents, but not an idex.

00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance

Another issue is that, because the EPA documents downplay the amount of water that would be consumed by this project, the cumulative impacts do not adequately consider the proposed project's use of large amounts of water. As a result, the EPA also does not adequately consider the actual drawdown of water or the long-term impacts that this water use could have on the environment and economy of the southwestern Black Hills. The southern Black Hills is a semi-arid area that will need all its ground water in the future. This need will grow with climate change and with the ongoing depletion of the High Plains (Ogallala) aquifer a bit to the south.

A third major problem is the admission that injectate from the Class V wells will mingle with Madison aquifer water and come to the surface 20 miles away. While the EPA says this will happen "on the scale of 10,000 years" in its Cumulative Effects Analysis, remember that the calculations of water movement underground at the Dewey-Burdock site vary widely. The information offered by Powertech's contractor suggests that water movement is many times slower than independent estimates. Also, there are other wells into the Minnelusa and Madison aquifers to the south and east, over the 20-mile span between the project site and Cascade Springs. This admission should negate the entire Class V application and send Powertech back to Canada, China, and the Cayman Islands.

The sections on ground water use in the Draft Cumulative Effects Analysis rely overly-much on the opinion of one person, the former South Dakota State Engineer. Other people should be consulted.

The statement that "radon-222 itself has very little radiological impact on human health or the environment" (p. 85, Cumulative Effects Analysis) runs counter to what can probably be called common knowledge. It certainly runs counter to the EPA's website on the topic: https://www.epa.gov/radon/health-risk-radon The UIC Program needs to go back to the drawing board and do a comprehensive, science-based analysis of this issue.

Along the same line, in its discussion of the Central Processing Plant, the Cumulative Effects Analysis says both that "ventilations systems will exhaust outside the building" and that there will be "open doorways" on processing buildings (p. 86). One would hope that, for the safety of workers, the open doorways are nowhere near the exhausts. This should be specified by the EPA, and potential employees should be fully informed of the situation.

Section 3.3.1 of the Cumulative Effects Analysis (p. 19) is vague on key aspects of the impacts that will occur to ground water quality in the ore zone. The second-to-last sentence of this section say that the company "will monitor groundwater using standard industry practices." This is repeated in the section on post-restoration monitoring (p. 22). These standard practices, of course, have been associated with all sorts of problems, including the ongoing failure to return even one ISL mine's water to baseline. The EPA can do better.

Similarly, the section ends with a statement that the EPA "concludes that impacts to ore zone water...should be minimal." How is "minimal" defined? Is it what the EPA will allow? Is it minimal to the company? Or is it minimal to the impacted communities? This term should receive better explanation.

We also disagree with the statement in Section 3.3.2.1, in which the EPA says that an excursion can be left as is, if it is not corrected within 60 days; instead, the company can increase its financial assurance obligation in a manner that is suitable to the NRC (p. 21). This is not acceptable.

However, for the EPA's documents to be complete, the existing Black Hills mine and the potential for a much larger number of ISL uranium mines must be fully considered. This need is even greater for the Class V draft permit, which might allow wastes from other mines to be injected into ground water in the Dewey-Burdock area.

3.0 IMPACTS TO USDWs
3.1 Potential Groundwater Consumption
discusses the drawdown impacts & that they will not occur after site decommissioning; therefore not considered to be long term

Taken out of context. The next statement says the decay products have the potential for radiological impacts to human health and the environment.

That is not what the paragraph states. Clarify these are NRC license requirements.

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00546 Troy S Weston
President
Oglala Sioux Tribe

00546 Troy S Weston
President
Oglala Sioux Tribe

00546 Troy S Weston
President
Oglala Sioux Tribe

00546 Troy S Weston
President
Oglala Sioux Tribe

00546 Troy S Weston
President
Oglala Sioux Tribe

And as for the third item, Powertech has claims to the east of the current project boundary, and it has contiguous claims just across the border in Wyoming. This is very clearly a topic that should be considered under any discussion of cumulative effects. According to our research, the company has approximately 744 federal claims in Wyoming, with the majority being across the border from the Dewey-Burdock project area.
The EPA omits important issues from its Draft Cumulative Effects Analysis. Three that are glaring are
1) the potential for mining wastes to be transported from other areas to Dewey-Burdock Class V wells,
2) the presence of other uranium companies in the Black Hills, and
3) the potential for uranium mining to expand onto Powertech/Azarga's contiguous claims on the Wyoming side of the state line (the Dewey Terrace project) and to the east on National Forest Service land. It's important to consider climate change, but it's also important to consider cumulative impacts that are on or adjacent to the proposed mine site.

Lastly, the cumulative impacts analysis prepared by EPA does not appear to account for
(1) the September 2014 two-page announcement from U.S. EPA stating that it has completed a Preliminary Assessment (PA) of the Darrow/Freezeout/Triangle abandoned uranium mines located within the area of the proposed Dewey-Burdock project; and
(2) the September 24, 2014 document from Seagull Environmental Technologies captioned as "Preliminary Assessment Report regarding the Darrow/Freezeout/Triangle Uranium Mine Site near Edgemont, South Dakota, EPA ID: SDN000803095." Attached, labeled Ex. OST-026.
Specifically, EPA's analysis must analyze the causation link not just between the unreclaimed surface mines and surface water contamination, but also ground water contamination. These EPA documents raise the issue of a causal link to the contamination of ground water and nearby ground water wells. The lack of analysis of these issues demonstrates a lack of basis for any findings regarding the baseline hydrogeology, and particularly groundwater connectivity issues at the site.
EPA concedes in these documents that additional data and sample collection for soils and surface waters is needed beyond what NRC Staff required or EPA has yet obtained. EPA states further that this data collection is necessary to better characterize and define source areas at the unclaimed uranium mines. Ex. OST-026 at 30. Importantly, these are the "source areas" for the "observed release to groundwater" that "has occurred at the site." Id. Thus, the fact that the proposed new sampling includes only soil and surface waters does not disconnect this issue from the "observed" ground water contamination.
Further, EPA's analysis reveals that "[s]ome significant data gaps exist within the information reported." Exhibit OST-026 at 29. BEPA analysis reveals for the first time that while "[g]roundwater samples were collected within the area of the Site from various wells; however, lack of ground water sampling data from near and upgradient of the Site limited availability of reliable background concentrations." Id. Also, EPA points out that although soil samples were collected at the site by Powertech, "of the 25 samples collected, only three were analyzed for additional radionuclides including uranium, Pb-210, and Th-230 – the other known contaminants on site." Id. Together, these EPA documents demonstrate that additional investigation is necessary at the site in order to establish the scientifically credible baseline analysis required by the SWDA, UIC regulations, NEPA, and the APA.

All considered, the discussion presented herein demonstrates that the applicant, and EPA, have failed to provide an adequate baseline geology and hydrogeology analysis and as a result fails to adequately analyze the impacts associated with the proposed mine, particularly on groundwater resources and with respect to the applicant's ability to contain mining fluid.

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

VI. INADEQUATE ANALYSIS OF DISPOSAL OF SOLID 11E2 BYPRODUCT MATERIAL

The EPA and applicant documentation indicate an intent to use the **White Mesa** Uranium Mill near the White Mesa Ute Community in Utah as the site for disposal of the radioactive wastes (known as 11e2 Byproduct material) generated by at the proposed Powertech Facility. The EPA analysis fails to acknowledge that the White Mesa Mill is not licensed to receive or dispose of all forms of Powertech's 11e2 Byproduct Material. EPA's draft permits do not, and cannot, authorize Powertech to dispose of 11e2 Byproduct Material at White Mesa. EPA appears to have failed to compare the impacts of transporting and disposing of the solid 11e2 Byproduct Material in Utah against any other alternative disposal site. Further, EPA's cumulative impact report fails to address the cumulative impact or alternatives to Utah licensing the White Mesa Mill as the disposal facility for the ISL wastes.

The EPA documents fail to provide a meaningful review of foreseeable impacts of generating many tons of solid 11e2 Byproduct Materials. Instead, EPA relies on blanket statements that permanent disposal will simply occur in conformance with applicable laws. This uncritical approach does not analyze any of the applicable criteria of regulations applicable to such 11e2 Byproduct Material disposal.

A proper review by EPA must ensure that the impacts and alternatives of creation, storage, and disposal of mill tailings – aka 11e2 Byproduct Material - are fully analyzed and addressed. Permanent disposal of solid 11e2 Byproduct material is a central feature of the proposed mining operation and a competent review must include an analysis of the impacts or alternatives to shipment and disposal at **White Mesa**. The NRC environmental documents confirm that **White Mesa** lacks a license approval from Utah to accept and dispose of the wastes created by the draft license or other NRC-licensed ISL facilities in the region. However, neither NRC's nor EPA's analysis includes a review of the impacts such disposition would entail, compares those impacts to other reasonable disposal alternatives, or assess whether disposal at White Mesa facility can be accomplished in accordance with applicable State and federal requirements.

The EPA's cursory discussion of the disposal of Powertech's 11e2 material contains no analysis of whether or not Utah law or the Mill owner's (Energy Fuels) license would allow the interstate transport and disposal of this waste given the history of leaks and violations at the White Mesa facility. Interstate transportation impacts across the Intermountain West are evident, but are dismissed without specific analysis. The EPA presents no information on the type of containers that would be required for the shipments to White Mesa and no corresponding information on the moisture content of the solid 11e2 Byproduct Materials or the anticipated decommissioning wastes.

EPA identifies no other site that is currently licensed to dispose of 11e2 Byproduct Material, implying that no other licensed facility exists in the United States that could accept the Powertech 11e2 Byproduct Material. Whether or not this is the case, White Mesa is not currently licensed to accept Powertech wastes. The failure to address and license the disposal of solid 11e2 Byproduct Material is not a technical deficiency that can be ignored or pushed off until a later time. EPA has a duty to provide specific information, analysis, and alternatives regarding this major feature of an ISL operation in order to allow the Tribe, the Ute Mountain Ute Tribe, the public, and other government decisionmakers to conduct a meaningful analysis of the full scope of environmental impacts involved with Powertech's proposal.

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

'00546 Troy S Weston
President
Oglala Sioux Tribe

00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

Upon selecting the White Mesa Mill as the proposed destination for the waste from this proposal and the region, as the EPA documentation has done, EPAmust follow through with the necessary analysis. The cumulative impacts report lacks analysis of disposal alternatives, including, but not limited to, access, geology, hydrogeology, quantitative impacts upon water supplies for domestic use, livestock, agriculture, non-domesticated plants and animals, and qualitative on-going and subsequent impacts to water supplies due to releases of chemicals into the surface, groundwater and aquifers flowing through the disposal site. Without such an analysis, EPA, the public, other governmental entities, and the Tribe have no basis to identify and assess alternatives to the license application and find ways to avoid or mitigate possible adverse environmental impacts of the proposed mine.
EPA must provide extra scrutiny to the packaging and transport of these wastes. Other NRC-licensed ISL projects have sent unspecified liquid radioactive wastes in leaking trucks.

The apparent violations involving the Smith Ranch include:
1. the failure to accurately assess the activity of pond sediment and barium sulfate sludge waste shipments;
2. the failure to adequately report the total activity for waste and resin shipments on the associated shipping documents;
3. the failure to accurately label waste shipment packages;
4. the failure to classify and ship the waste packages as Low Specific Activity level two (LSA-II) material;
5. the failure to ship LSA-II waste material in appropriate containers;
6. the failure to ensure by examination or appropriate tests that packages were proper for the contents to be shipped and closure devices were properly secured;
7. the failure to perform evaluations or perform tests that ensured the transportation package would be capable of withstanding the effects of any acceleration and vibration normally incident to transportation;
8. the failure to provide the name of each radionuclide listed and an accurate chemical description of contents; and
9. the failure to provide function specific training to a hazmat employee concerning the requirements that are specifically applicable to the functions the employee performed.

http://www.wise-uranium.org/umopuswy.html#SMITHR (NRC Inspection Report Apr. 3, 2017) The WISE-Uranium site reports a series of problems indicating the ISL industry appears to be plagued with irregularities and other problems that question NRC's licensing and regulatory diligence. Id., see also http://www.wise-uranium.org/new.html (ISL Spill of the Day). Under these circumstances, EPA must not simply rely on NRC's assumptions and must instead diligently investigate and carry out its own analysis of the radioactive and hazardous waste stream involved with the SDWA permitting.
South Dakota Department of Game Fish, and Parks (GF&P) reviewed information provided in the Public Notice: Administrative Record for the Dewey-Burdock Class III and Class V Injection Well Draft Area and "Additional Administrative Record Documents." Agency comments result exclusively from evaluation of the analysis found in the Additional Administrative Record Documents and specifically the Draft Cumulative Effects Analysis (Administrative Record). Our evaluation identifies issues listed below.
- South Dakota Mine Permit
- Avian management planning
- Affected environment
- Species of state concern
- Waste disposal options
- Process pond mitigation

00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

'00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

'00556 Stan Michals
South Dakota
Department of
Game Fish, and
Parks

Avian Management Plan

The Administrative Record identifies an avian management plan. At this time, the management plan is conceptual, has not undergone agency review and essentially does not exist; therefore the extent and effectiveness of mitigation cannot be substantiated.

The Dewey Burdock Project proposes a plan to mitigate impacts to avian species during operations, however, special emphasis is given to bald eagles. Monitoring wells, a processing plant, production well fields, disposal facilities, and a supply water well are all currently proposed within a buffer established for an active bald eagle nest. During the life of the project, seasonal restrictions and unspecified mitigative measures are proposed for the facilities. The Administrative Record does not analyze the viability of seasonal mitigation measures on continuously operated facilities. Analysis also does not consider the questionable effectiveness of seasonal mitigation during times of urgent maintenance or situations requiring emergency repairs on continuously operated facilities. Mitigation measures also rely on individual eagle tolerance; as tolerance is known to vary greatly among individuals. Unsuccessful mitigation risks a disturbance take. Analysis in the Administrative Record does not recognize the necessity of bald eagle take permitting.

Administrative Record fails to recognize or establish the relationship between the site's prairie dog colonies and avian management. The site's prairie dog colonies are the presumed forage base and home range for bald eagles and other avian species. The Administrative Record does not describe the project's direct and cumulative effects on prairie dog colonies, and collateral impacts on bald eagles and other avian species.

Authorization of UIC activities on the site provides a reasonable risk of unpermitted bald eagle disturbance take. Seasonal mitigation in the discernible method of nesting bald eagle protection but USFWS take permitting is done "only" if necessary. Obtaining a permit out of necessity implies a response to a situation that may already has constituted disturbance or take. Operation of UIC permits in important bald eagle habitat, and the uncertainty associated with a seasonal mitigation strategy continuously operated facility will result in the probability of take. The Administrative Record does not assess the probability of bald eagle take during project operation.

Species of state (South Dakota) concerns

Section 14.2, "Species of State and Tribal Interest: The Short-Horned Lizard" does not describe species of state interest. For a complete listing of state threatened, endangered or rare species see: http://gfp.sd.gov/wild life/threatened-endangered/.

Waste disposal options

The Administrative Record does not analyze the potential for combined disposal methods (deep well and land application), or the potential for onsite disposal of wastes produced off site. Section '10.1 Overview of Operations' in the Class III permit states that Powertech may use land application in conjunction with deep disposal wells or by itself.

Process Pond mitigation

The Administrate Record is silent on the ecologic impact of process ponds containing toxic solutions or viability of mitigation measures. Section '14.0 Impacts To Ecological Resources' did not include analysis of direct and cumulative impacts to migratory birds and bats exposed to toxic solutions contained in the projects process related ponds.

07460 (5/8 Rapid City hearing)	Rodney Knudson
07461 (5/9 Rapid City hearing)	Joni Tobacco Oglala Sioux Tribe employee with the Tribe's Natural Resources Regulatory Agency testifying as a private citizen
00399	Stan Michals South Dakota Game, Fish and Parks

Yesterday I printed off the 151-page EPA summation entitled "Draft Cumulative Effect Analysis of the Dewey-Burdock Uranium In-Situ Recovery, Underground Injection Control Permit." I took the time to read it all day. And it was a good report.
And it says -- the report pointed a rather benign -- painted a rather benign picture of the mining process, ending with kudos for the small carbon footprint left by the power plants that produce that electricity from the enriched uranium. Not mentioned was the enormous amount of electricity required to isolate uranium-234, -235, -238, generated by coal, oil, or gas power plants, but more importantly, toxic products of this process that we are creating with no safe place to put them.

You've issued a 151-page draft Cumulative Effects Analysis. I was hoping to see more than seven sentences on tribal concerns. Seven sentences is what was given to the Great Sioux Nation.
Dakota Access, Keystone XL, Crow Butte, and Powertech, where is the cumulative effects analysis for all of the permits and aquifer exemptions that have the potential to impact the tribes of the Great Sioux Nation? I don't see your Agency fulfilling any type of trust responsibilities in this regard, and it falls on us to fight. It seems that all we do is fight for our water, for environment, for our survival.
Do you have any idea the impacts that has on a society of people? I don't see that in your socioeconomic impacts analysis. I want to make a request, that you do an assessment of the psychological impacts your Agency's actions, and maybe inactions, have on the Great Sioux Nation.
Also, please consider the impacts these mining activities have on the cottonwood forests on the Cheyenne River and the White River.
Our tribe struggles with identifying whose responsibility it is to identify these impacts, these cumulative impacts on our tribe when it comes to these two mines, one in Crow Butte, Nebraska, and one -- the one up here.
Is it the NRC? Is it the EPA? It's unclear at this point. And I think it's the federal government's responsibility to figure out whose job it is to identify just how your actions are impacting my people.

I am reviewing information provided for in the 'Public Notice: Administrative Record for the Dewey-Burdock Class III and Class V Injection Well Draft Area Permits' https://www.epa.gov/uic/administrativerecord- dewey-burdock-class-iii-and-class-v-injection-well-draft-area-permits . I'm unclear if the "Additional Administrative Record Documents", specifically, the 'Draft Cumulative Effects Analysis' are considered a component of the Class III and V draft permits and thus subject to review and comments. The statement below is copied from the website and if read literally, it could be understood to mean that comments are sought only for the Class III and V draft area permits, and the identification of traditional cultural properties...My agency would like to provide comments on both the contents of the permits and Draft Cumulative Effects Analysis. Please provide us with an explanation of the scope of EPA's request.
In addition to seeking comments on the Class III and V draft area permits, the EPA is seeking public comment on the identification of traditional cultural properties at the Dewey-Burdock Project Site Area of Potential Effects, on the potential adverse effects of the proposed project, and on measures to avoid, minimize or mitigate potential adverse effects on historic and traditional cultural properties pursuant to Section 106 of the National Historic Preservation Act and 36 CFR § 800.2(d) and § 800.6(a)(4).
The EPA is also seeking comment on two options for approval of the aquifer exemption that Powertech requested related to the Class III permit application. The two options are discussed in the Aquifer Exemption Draft Record of Decision available on the EPA Region 8 UIC Program website.
The EPA has performed an Environmental Justice (EJ) analysis for the Dewey-Burdock UIC permitting actions and is seeking comment on the Draft EJ analysis document.

Include this comment in the EJ list

already responded to this question via email
[dated]

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

There should also be clarification of the length of time that the proposed Dewey-Burdock project would be active. This goes directly to the potential impacts of the project. The estimate in the State Mining Permit Application is seven to 20 years of uranium recovery, maybe more, with the Central Processing Plant likely to operate longer. The Class III draft permit is for the "operating life of the facility" (p. 7). At 14 wellfields, each operating for two years, this could be as long as 28 years, if the company ran them consecutively. There is also the potential for the company to expand the project to include its contiguous claims to either the east or west of the current project area. There's a difference between regulating a project that lasts seven years and regulating a project that lasts over 20 years. As stated repeatedly, the draft permits and Cumulative Effects Analysis should discuss the full range of potential impacts and scenarios.

There is also a question about the rate of pumping of water during the mining process. In Section 5.2.1 of the Draft Cumulative Effects Analysis, the text says that the "header piping [would be] designed to accommodate injection and production flow rates of 2,000 gpm...." (p. 56). On the next page, the document says that there would be 100 wells per header house. The schedule for the project indicates that as many as five wellfields will be active at one time. As each wellfield is likely to have more than 100 wells, these numbers add up to more than the 8,500 gpm that the company has asked to use in its more recent documents. This situation needs to be carefully researched and analyzed before any further action is taken on the proposed project.

The applicant's project has also changed in important respects between the time the NRC began considering it and the time the EPA began considering it. Examples include:
[...]
• The projected bleed rates have varied over time, from .5% of the water used to 17% of the water used. In addition, the reverse osmosis process makes at least 30% of the water put through the RO process into waste, and this is not fully considered in the EPA documents. This seriously weakens all the assumptions and calculations on water use in the Class III draft permit and in the Draft Cumulative Effects Analysis.
• Documents prepared by Petrotek for Powertech/Azarga set subsurface water movement rates at 6 to 7 feet per year (without offering peer-reviewed sources). NRC documents set the transmissivity rate in the Fall River formation at 255 ft.2 per day and in the Lakota formation at 150 ft.2 per day. Dr. Perry Rahn's 2014 article, mentioned above, concluded that the average ground water velocity for the Lakota and Fall River formations in the Dewey-Burdock area was 66.1 ft./year. But, he said, groundwater velocity in the Inyan Kara Aquifers at the Dewey-Burdock site might be as much as 5,480 feet per year – over a mile -- which "might indicate fast groundwater movement through very permeable units or through fractures," although he considered this number "very high." The draft permits omit this critical information that could have very real impacts on wells that are downgradient of the proposed mine site. This issue is critically important, and further independent studies should be done before any permit is issued.

• Powertech talked about the possibility of doing open pit mining at the NRC hearings, and this possibility is not raised in the EPA documents.

These changes in the parameters of the proposed project go to the heart of the information that informs the process in this case. The NRC and the EPA have had different projects submitted to them. The processes are not functional equivalents, and consideration of both projects would not be redundant – it would be sensible. The EPA should begin a thorough NEPA process to assess the project as it is currently proposed.

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

'00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

00527 Lilias Jones
Jarding, Ph.D.
Clean Water
Alliance

A glaring problem with the EPA's documents on the proposed project is that large portions of the documents used to support the EPA's draft permits are based on other permits that do not exist or that were prepared inadequately. For example, the EPA's documents defer repeatedly to the NRC's SEIS for the Dewey-Burdock project. This document echoed Powertech/Azarga's submissions in all important respects, rather than the NRC taking a hard look at the situation. The EPA documents also refer repeatedly to the requirements of a state NPDES permit that has not even been applied for. And they refer frequently to a state Large Scale Mine Permit and a state Groundwater Discharge Permit (GDP) that have just barely begun the hearing process, are on hold, and are far from issuance.

o rely on non-existent regulatory instruments and what are essentially the applicant's documents for large portions of the permitting documents indicates both problems with the regulatory process and a lack of analysis of the proposed mine, deep disposal wells, and aquifer exemption. These non-existent "permits" are relied upon for major aspects of the proposed mine and associated facilities. For example, the GDP and NPDES permits are relied upon for statements that the land waste disposal option will be safe and that there will be no contamination. This runs counter to the research on this topic, which indicates a build-up of highly-toxic selenium at a similar site. And then the EPA signs off on Powertech's proposal to grow crops on the land disposal sites without any analysis of the safety of this practice for wildlife, domesticated animals, or humans. This is a problem.

Similarly, the EPA relies upon an "NPDES permit" that hasn't even been applied for to discuss the Emergency Preparedness Program and Environmental Management Plan that are the basis of its discussion of impacts from spills and leaks, worker safety, and other topics. The agency concludes "Because the project site will be reclaimed and released for unrestricted use," there won't be impacts to land use. It's a long way from a non-existent "permit" to full reclamation twenty years down the line. This use of speculative information should not be allowed as part of the application, cumulative effects, draft permit, or aquifer exemption documents.

Some other examples of the reliance upon non-existent "permits" for key aspects of the Cumulative Effects analysis can be found pages 36, 39, 51, 53, 54, 55 (3 times!), 60, 61, 67, 71, 72 (3 times!), 74, 75 (3 times!), 79, 83, 88, 96, 109, 125, 132, 137, 138, 139, 140, 142, and 143. Until if and when the suggested permits are issued, information based on non-permits should be omitted from the EPA's documents. A realistic, complete EPA analysis should be done.

The agency must also rely on its own work, not just the information provided by Powertech, for critical information such as the "maximum volume of liquid wastes injected into the deep injection wells during aquifer restoration" (Cumulative Effects, p. 76). This number is central to the discussion of the Class V wells and should be determined independently of the applicant. If this number is wrong, so are all the assumptions and mitigation measures offered in the draft permits and other project documents.

As mentioned above, modeling is a weak alternative to on-the-ground testing. The EPA should certainly not rely exclusively on models for any decision or requirement in the case of such a complex, controversial project – especially models developed by or for Powertech. There should be independent analysis of any information currently left to modeling. As the EPA notes in the Cumulative Effects Analysis, "there is inherent uncertainty in the results" (p. 108) when modeling is involved.

At the end of the Class V Fact Sheet and the Draft Cumulative Effects Analysis, the EPA indicates that the Endangered Species Act will be complied with, but gives no information on how it intends to do this. When will this be done? What species will be considered? Who will do the analysis (not the company)? This should already have been completed before draft permits were issued

ESA

'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance
00556	Stan Michals South Dakota Department of Game Fish, and Parks

The EPA mentions the presence of a short-horned lizard, which is rare and protected in South Dakota, in the proposed project area. After stating that the species is "important in some tribal cultures," it offers the solution "Once construction activities begin at the site, the EPA expects that the [sic] any short-horned lizards that were in the area will seek less disturbed locations." This is pure conjecture, without any back-up information on the size or habits of the lizards. Are they territorial, or is it species-appropriate for them to move? Are they large enough to move fast enough to out-run a bulldozer or pick-up truck? Or are they, in reality, unprotected?

This and similar information must be provided and backed by scientific research at the Dewey-Burdock site for this and other species. Animals should not simply be expected to move out of a site that's over 10,000 acres in a systematic and comprehensive process. And the EPA then expects them to just move back in after mining is complete – as if the same animals will be alive and remember their former homes after as many as 20 years. This is beyond unacceptable in the direction of ludicrous – and is certainly unacceptable

Species other than animals are not considered in this discussion. Plants cannot simply move off the site. Some of them are important to tribal practices and customs, such as medicinal plants and timpsila (prairie turnips). Full scientific information should be gathered, and full analysis must be done, for non-animal species. Species that are important to the long-term residents of the area -- the Lakota, Cheyenne, and other native nations – require special protection. There is already information on protection of some species in project documents that could serve as a base for part of this analysis. However, a full and independent analysis is also needed.

This analysis would include close consideration of the opinion of the South Dakota Department of Game, Fish and Parks. This opinion was stated in an October 17, 2008, letter written by Stan Michals. Michals said that exploratory activity should not take place on some parts of the project area between February and August (inclusive) due to the presence of a bald eagle nest (a state-protected bird) and a redtail hawk nest. Mining, deep disposal wells, land application, and reclamation, which are more long-lasting and disruptive than exploration, should clearly also not take place during those seven months of the year in raptor nesting and other protected areas.

The sturgeon chub must be included in the discussion of wildlife concerns. It is present in the Cheyenne River and may be threatened or endangered in areas downstream from the proposed mine. Additional silt, heavy metals, and radioactive materials would be potential threats.

In addition, the EPA should not rely on the NRC's analysis, recommendations, or regulations. The processes by the two agencies should be independent, so that the proposed mine, disposal wells, and aquifer exemption receive the benefits of the expertise and different regulatory focuses of both agencies.

Affected environment

The Administrative Record does not include the site's available wildlife data in describing impacts to ecological resources. Scant use of citations in the Administrative Record makes it difficult to determine what available wildlife study data is used to describe the affected environment. It is reasonable to believe that wildlife data is only as current as the date of application. However it must be noted that it has been almost 10 years since the EPA has started its UGI evaluation. During that time, new wildlife and habitat data have enhanced understanding of the site's ecological conditions. Also, recently listed ESA species may exist on site. The Administrative Record did not adequately describe the affected environment or impacts to ecological resources.

ESA

ESA

ESA

ESA

ESA

ESA

00556	Stan Michals South Dakota Department of Game Fish, and Parks
00556	Stan Michals South Dakota Department of Game Fish, and Parks
00556	Stan Michals South Dakota Department of Game Fish, and Parks
00556	Stan Michals South Dakota Department of Game Fish, and Parks
00556	Stan Michals South Dakota Department of Game Fish, and Parks
07461 (5/9 Rapid City hearing)	Nancy Hilding Prairie-Hills Audubon Society
'00527	Lilias Jones Jarding, Ph.D. Clean Water Alliance

Additional wildlife information includes:
Prairie dog colonies: The initial baseline wildlife survey documents only 3 of the 7 prairie dog colonies known to exist in the wildlife study area. The significance of the ecologic function of both the existing and newly identified prairie dog colonies is unknown. Direct and cumulative UIC impacts on prairie dog viability are not considered in the Administrative Record.

Bats: The USFWS ESA listing of the Northern Long-eared Bat is a significant change since permitting began on the Dewey Burdock Project. The Administrative Record does not address the recent ESA listing or the habitat potential of the project area's historic mine workings

Burrowing owls: Recent wildlife surveys by Powertech have identified burrowing owls use in one of the project area's prairie dog colonies. The extent of burrowing owl use at the site's existing or newly discovered colonies is unknown.

Bald eagle: The bald eagle nest identified in the initial wildlife survey is no longer in use, but an alternated nest is now the primary nest site. Powertech proposes construction and facility operation within active bald eagle nest buffers. The Administrative Record does not consider bald eagle disturbance take resulting from project effects on forage areas and home range.

Reptiles and amphibians: The rational to determine impacts to short-horned lizard on page 149 of the Draft Cumulative Effects Analysis is unfounded. The rational presumes that native prairie, the preferred habitat of lizards, does not exist on rangelands and since impacts are on rangelands, lizards will not be impacted. The rational originates from Section 6.0 'Impacts To Land Use'. Baseline study from the project identifies native vegetation and "widespread occurrence" of an unknown lizard species. The Administrative Record does not identify native vegetation, cumulative effects of conversion of native vegetation, or direct impacts on lizards.

Connected actions and -- connected actions and cumulative effects not discussed in the DEISs -- or SEISs.

Another problem that has been common in the mine area and that is omitted from the EPA's discussion is wildfires. There have been at least three large wildfires in the area in the last five years. The Crow Butte ISL mine – only about 65 miles from Dewey-Burdock -- was evacuated in 2012 due to a wildfire. The impacts on water, air, and land could be enormous, if a building containing nuclear materials, wellfields, or storage ponds were impacted by a wildfire. The discussion of cumulative effects must include a thorough discussion of how this type of problem would be dealt with to protect the land, air, and water.

ESA

ESA

ESA

ESA

ESA

are wildfires within the CEA scope?